

# **National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2)**



# **Department of Energy and Climate Change**

## **National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2)**

Presented to Parliament pursuant to section 5(9)  
of the Planning Act 2008

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# Part 1 Introduction

## 1.1 Background

- 1.1.1 Fossil fuel generating stations play a vital role in providing reliable electricity supplies and a secure and diverse energy mix as the UK makes the transition to a low carbon economy. As part of the transition towards a secure decarbonised electricity system, the move to clean coal through the development and deployment of carbon capture and storage technologies offers the opportunity to reduce fossil fuel generating stations' carbon emissions by around 90%. It is Government policy that all new coal-fired generating stations should be required to capture and store the carbon emissions from a substantial proportion of their capacity.
- 1.1.2 The Government will continue public sector investment in four carbon capture and storage (CCS) demonstration projects. It is expected that any new conventional coal-fired generating stations consented under the policy framework described in EN-1 Section 4.7 will retrofit CCS to their full capacity during the lifetime of the plant. Other generating stations to which this NPS applies are required to be "carbon capture ready" as set out in EN-1 Section 4.7. Operators of fossil fuel generating stations will be required to comply with Emissions Performance Standards as appropriate.

## 1.2 Role of this NPS in the planning system

- 1.2.1 This National Policy Statement (NPS), taken together with the Overarching National Policy Statement for Energy (EN-1), provides the primary basis for decisions by the Infrastructure Planning Commission (IPC) on applications it receives for nationally significant fossil fuel electricity generating stations as defined at Section 1.8. The way in which NPSs guide IPC decision making, and the matters which the IPC is required by the Planning Act 2008 to take into account in considering applications, are set out in Sections 1.1 and 4.1 of EN-1.
- 1.2.2 Applicants should ensure that their applications, and any accompanying supporting documents and information, are consistent with the instructions and guidance given to applicants in this NPS, EN-1 and any other NPSs that are relevant to the application in question.
- 1.2.3 This NPS may be helpful to local planning authorities (LPAs) in preparing their local impact reports. In England and Wales this NPS is likely to be a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990 (as amended). Whether, and to what extent, this NPS is a material consideration will be judged on a case by case basis.

- 1.2.4 Further information on the relationship between NPSs and the Town and Country Planning system, as well as information on the role of NPSs, is set out in paragraphs 13 to 19 of the Annex to the letter to Chief Planning Officers issued by the Department for Communities and Local Government (CLG) on 9 November 2009<sup>1</sup>.
- 1.2.5 Paragraphs 1.2.2 and 4.1.6 of EN-1 provide details of how this NPS may be relevant to the decisions of the Marine Management Organisation (MMO) and how the Marine Policy Statement (MPS) and any applicable Marine Plan may be relevant to the IPC in its decision making.

## 1.3 Relationship with EN-1

- 1.3.1 This NPS is part of a suite of energy infrastructure NPSs. It should be read in conjunction with EN-1 which covers:
- the high level objectives, policy and regulatory framework for new nationally significant infrastructure projects that are covered by the suite of energy NPSs and any associated development (referred to as energy NSIPs);
  - the need and urgency for new energy infrastructure to be consented and built with the objective of contributing to a secure, diverse and affordable energy supply and supporting the Government's policies on sustainable development, in particular by mitigating and adapting to climate change;
  - the need for specific technologies, including the infrastructure covered by this NPS;
  - key principles to be followed in the examination and determination of applications;
  - the role of the Appraisal of Sustainability and its outcome in relation to the suite of energy infrastructure NPSs;
  - policy on good design, climate change adaptation and other matters relevant to more than one technology-specific NPS; and
  - the assessment and handling of generic impacts that are not specific to particular technologies.
- 1.3.2 This NPS does not seek to repeat the material set out in EN-1, which applies to all applications covered by this NPS unless stated otherwise. The reasons for policy that is specific to the energy infrastructure covered by this NPS are given, but where EN-1 sets out the reasons for general policy these are not repeated.

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<sup>1</sup> <http://www.communities.gov.uk/documents/planningandbuilding/pdf/1376507.pdf>

## **1.4 Future planning reform**

- 1.4.1 Aside from cases where the Secretary of State intervenes, or where the application is not covered by a designated NPS, the Planning Act 2008, as it is in force at the date of designation of this NPS, provides for all applications for development consent to be both examined and determined by the IPC. However, the enactment and entry into force of the provisions of the Localism Bill (introduced into Parliament in December 2010) relating to the Planning Act would abolish the IPC. The function of examining applications would be taken on by a new Major Infrastructure Planning Unit (“MIPU”) within the Planning Inspectorate and the function of determining applications on major energy infrastructure projects by the Secretary of State (who would receive a report and recommendation on each such application from MIPU). In the case of energy projects, this function would be carried out by the Secretary of State for Energy and Climate Change.
- 1.4.2 If the Localism Bill is enacted and these changes take effect, references in this NPS to the IPC should be read as follows from the date when the changes take effect. Any statement about the IPC in its capacity as an examining body should be taken to refer to MIPU. Any statement about the IPC in its capacity as a decision-maker determining applications should be taken to mean the Secretary of State for Energy and Climate Change in his capacity as decision-maker. MIPU would have regard to such statements in framing its reports and recommendations to the Secretary of State.

## **1.5 Geographical coverage**

- 1.5.1 This NPS is made under the Planning Act 2008, which applies in England and Wales to applications for fossil fuel generating stations with over 50 MW generating capacity.
- 1.5.2 In Scotland, the IPC will not examine applications for nationally significant generating stations. However, energy policy is generally a matter reserved to UK Ministers and this NPS may therefore be a relevant consideration in planning decisions in Scotland.
- 1.5.3 In Northern Ireland, policy and planning consents for all energy infrastructure projects are devolved to the Northern Ireland Executive, so the IPC will not examine applications for energy infrastructure in Northern Ireland.

## **1.6 Period of validity and review**

- 1.6.1 This NPS will remain in force in its entirety unless withdrawn or suspended in whole or in part by the Secretary of State. It will be subject to review by the Secretary of State in order to ensure that it remains appropriate for IPC decision making. Information in respect of the review process is set out in paragraphs 10 to 12 of the Annex to CLG’s letter of 9 November 2009 (see paragraph 1.2.4 above).

## 1.7 Appraisal of Sustainability and Habitats Regulations Appraisal

- 1.7.1 All of the energy NPSs have been subject to an Appraisal of Sustainability (AoS)<sup>2</sup> incorporating the requirements of the regulations that implement the Strategic Environmental Assessment Directive<sup>3</sup>. General information on the AoSs can be found in paragraph 1.7.1 of EN-1. Habitats Regulations Assessment was also done for all the energy NPSs. Paragraph 1.7.13 of EN-1 sets out the conclusions of the HRA.
- 1.7.2 Key points from the AoS for EN-2 are:
- Fossil fuel generating infrastructure development has similar effects to other types of energy infrastructure, resulting from impacts associated with large facilities at single sites; therefore, for the majority of the AoS objectives, the strategic effects of EN-2 are considered to be neutral or negative, but uncertain.
  - Through supporting the transition to a low carbon economy, EN-2 is considered likely to have positive effects on the Economy and Skills, and Health and Well-being as secondary benefits and positive effects in the medium/long term on climate change. However these positive effects are uncertain because of the need to demonstrate viability of CCS.
  - Effects on Ecology, Resources and Raw Materials, Flood Risk and Coastal Change, Water Quality, and Landscape, Townscape and Visual are considered to be generally negative. Again the assessment was uncertain because the effects on the sensitivity of the environment and the location and design of specific infrastructure.
  - There are also likely to be some negative effects on Air Quality and Well-being, given the link between air quality and public health.
  - Neutral effects were identified for Noise, and Traffic and Transport, which are considered to be localised and therefore neutral at national level. Neutral effects were also identified for Archaeology and Cultural Heritage, and Soils and Geology, as they are likely to be site related, but with some uncertainty. Effects on equality were assessed as neutral, balanced between potential positive economic impacts and potentially negative localised impacts.
- 1.7.3 As required by the SEA Directive, Part 2 of AoS 2 also includes an assessment of reasonable alternatives to the policies set out in EN-2 at a strategic level. The two alternatives assessed were:
- (a) a stricter approach to Carbon Capture and Storage (CCS) (e.g. no new coal without CCS, or no new fossil fuel plants without a substantial amount of CCS from the outset); and
  - (b) a stricter approach to Carbon Capture Readiness (CCR) (i.e. more demanding criteria set for demonstrating that retrofit CCS will be economically feasible).

<sup>2</sup> As required by Section 5(3) of the Planning Act 2008

<sup>3</sup> Directive 2001/42/EC of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

- 1.7.4 Assessment showed that alternative (a) could potentially have increased positive effects on climate change and the economy, although there are uncertainties associated with these positive effects. Over the remaining sustainable development themes, alternative (a) could produce either greater positive or negative effects. Where CCS viability is not demonstrated on a wider and deeper basis there are likely to be smaller negative effects compared with EN-2, and where it is demonstrated on a wider and deeper basis there are likely to be greater negative effects. While encouraging wider or deeper deployment of CCS in the short term may appear attractive, there is a risk that trying to do this simply through the planning regime, without taking account of other interventions which may be necessary to encourage a stronger commitment to CCS on the part of developers, will be counterproductive. Continuing with the policy set out in EN-2 is therefore preferred.
- 1.7.5 Assessment showed that alternative (b) could have minor negative effects on security of energy supply and the economy as fewer fossil fuel plants are likely to be built, but that there could be minor positive effects on the climate change objective. While alternative (b) may result in a reduced number of applications for fossil fuel generating plant, it is likely to result in clustering in more preferential locations and regions. This means that effects on the remaining sustainable development topics are likely to be less negative on a national scale, and clustering may be more efficient from an economic point of view, but it would increase cumulative effects in these preferential regions. While tighter CCS criteria could mean that the risk of a high carbon lock-in is reduced, such criteria would need to be based on a more precise estimate of carbon prices, which is not currently available. Therefore, while this may change in the future, there is currently no compelling case for changing the policies on CCR in EN-2.

## **1.8 Infrastructure covered by this NPS**

- 1.8.1 This NPS covers the following types of nationally significant electricity generating infrastructure over 50 MW electricity generating capacity:
- coal-fired;
  - gas-fired;
  - integrated coal gasification combined cycle; and
  - oil-fired.
- 1.8.2 In addition biomass co-firing can be used in fossil fuel generating stations. Biomass-only generating stations are covered in the Renewable Energy Infrastructure NPS (EN-3).
- 1.8.3 Fossil fuel generating stations can be configured to produce Combined Heat and Power (CHP) and be CCR and/or have CCS technology applied. Details of the Government's policy in these areas are set out in EN-1 with further information in this NPS.

# Part 2 Assessment and technology-specific information

## 2.1 Introduction

- 2.1.1 Part 4 of EN-1 sets out the general principles that should be applied in the assessment of development consent applications across the range of energy technologies. Part 5 sets out policy on the assessment of impacts which are common across a range of these technologies (“generic impacts”). This NPS is concerned with impacts and other matters which are specifically associated with fossil fuel generating stations or where, although the impact is generic and covered in EN-1, there are further specific considerations arising from this technology.
- 2.1.2 The policies set out in this NPS are additional to those on generic impacts set out in EN-1 and do not replace them. The IPC should consider this NPS and EN-1 together. In particular, EN-1 sets out the Government’s conclusion that there is a significant need for new major energy infrastructure (see summary and conclusion in Part 3 of EN-1). EN-1 Section 3.6 includes assessments of the need for new nationally significant fossil fuel generation infrastructure. In the light of this, the IPC should act on the basis that the need for the infrastructure covered by this NPS has been demonstrated.

## 2.2 Factors influencing site selection by developers

- 2.2.1 Factors influencing site selection by applicants for fossil fuel NSIPs are set out below. These are not a statement of Government policy, but are included to provide the IPC and others with background information on the criteria that applicants consider when choosing a site. The specific criteria considered by applicants, and the weight they give to them, will vary from project to project. The choices which energy companies make in selecting sites reflect their assessment of the risk that the IPC, following the general points set out in Section 4.1 of EN-1, will not grant consent in any given case. But it is for energy companies to decide what applications to bring forward and the Government does not seek to direct applicants to particular sites for fossil fuel generating stations.

### Land Use

- 2.2.2 Fossil fuel generating stations have large land footprints and will therefore only be possible where the applicant is able to acquire a suitably-sized site. The site will also need to be big enough to conform to Government policy on CCR and CCS, set out in Section 4.7 of EN-1 and in Section 2.3 below.
- 2.2.3 Depending on the processes adopted, CCR, CCS and mitigation measures for emissions by fossil fuel generating stations may require storage and use of hazardous chemicals regulated under the Control of Major Accident Hazards

(COMAH) Regulations 1999, which may have an impact on potential land-use in the vicinity. This in turn may affect the applicant's choice of site.

- 2.2.4 Development of a CHP generating station may also have an effect on the size of site required and land-use. Details of land-use impacts are set out in Section 5.10 of EN-1.

### Transport Infrastructure

- 2.2.5 New fossil fuel generating stations need to be accessible for the delivery and removal of construction materials, fuel, waste and equipment, and for employees.
- 2.2.6 Government policy encourages multi-modal transport and materials (fuel and residues) may be transported by water or rail routes where possible. (See Section 5.13 of EN-1 on transport impacts). Applicants should locate new fossil fuel generating stations in the vicinity of existing transport routes wherever possible. Although there may in some instances be environmental advantages to rail or water transport, whether or not such methods are viable is likely to be determined by the economics of the scheme. Road transport may be required to connect the site to the rail network, waterway or port. Any application should therefore incorporate suitable access leading off from the main highway network. If the existing access is inadequate and the applicant has proposed new infrastructure, the IPC should satisfy itself that the impacts of the new infrastructure are acceptable as set out in Section 5.13 of EN-1.

### Water Resources

- 2.2.7 Some fossil fuel generating stations have very high water demands, for example coal-fired and combined cycle gas turbine (CCGT) generating stations. Other technologies, for example open cycle gas turbines, have little water demand.
- 2.2.8 In coal-fired and CCGT generating stations, purified water is needed to produce the steam to drive the generating turbines and additional large volumes of water are needed to condense this steam back to water for reuse. A supply of water will also be needed for CCS processes. The amount of water abstraction required and whether discharge is necessary will depend on the applicant's choice of technology, particularly the cooling system, in the proposed design. The volumes required and availability will depend on a number of factors including:
- the extent of the water resource;
  - the likely flow rate within the body of water;
  - water supply company management plans;
  - the visual impact of the chosen system; and
  - the power consumption of the cooling system.
- 2.2.9 High water demands will mean that developers' preferred sites are likely to be coastal, beside estuaries or alongside large rivers. If sufficient quantities of water from natural sources are not available at a site then some use of mains supplies may be necessary, although it should be noted that a water

company has no duty to supply water. If a sufficient supply of water is not available, an alternative means of cooling such as air-cooled condensers would be required. The regulation of water abstraction and discharge is described in Section 5.15 of EN-1. The applicant should have investigated the availability of such a supply at an early stage. Any proposals for alternative sites proposed during the application process should demonstrate that an adequate supply of water would be available.

### **Grid Connection**

- 2.2.10 Fossil fuel generating stations connect into a transmission network. The technical feasibility of export of electricity from a generating station is dependent on the capacity of the grid network to accept the likely electricity output together with the voltage and distance of the connection.
- 2.2.11 Applicants will usually have assured themselves that a viable connection exists before submitting the development proposal to the IPC and, where they have not done so, they take that commercial risk. Even if the precise route of a connection has not been identified, in accordance with Section 4.9 in EN-1 any application to the IPC must include information on how the generating station is to be connected and whether there are any particular environmental issues likely to arise from that connection. Further advice on the relationship with grid applications is in EN-1 and EN-5.

## **2.3 Government policy criteria for fossil fuel generating stations**

- 2.3.1 The following criteria must be met before consent for a new fossil fuel generating station can be given.

### **Combined Heat and Power**

- 2.3.2 The Government's strategy for CHP is described in Section 4.6 of EN-1, which sets out the requirements on applicants either to include CHP or present evidence in the application that the possibilities for CHP have been fully explored.
- 2.3.3 Given the importance which Government attaches to CHP, for the reasons set out in EN-1, if an application does not demonstrate that CHP has been considered the IPC should seek further information from the applicant. The IPC should not give development consent unless it is satisfied that the applicant has provided appropriate evidence that CHP is included or that the opportunities for CHP have been fully explored. For non-CHP stations, where there is reason to believe that opportunities to supply heat through CHP may arise in the future the IPC may also require that developers ensure that their stations are 'CHP ready' and are configured in order to allow heat supply at a later date, as described in paragraph 4.6.8 of EN-1 and the guidance on CHP issued by BIS in 2006<sup>4</sup>.

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<sup>4</sup> Guidance on background information to accompany notifications under Section 14(1) of the Energy Act 1976 and applications under Section 36 of the Electricity Act 1989.

## Carbon Capture Readiness

- 2.3.4 The Government's policy and criteria for CCR for new combustion generating stations with a generating capacity at or over 300 MW are set out in Section 4.7 of EN-1. If an application does not demonstrate that CCR has been assessed according to this policy, the IPC should seek further information from the applicant. The IPC should not give development consent unless it is satisfied that the proposed development meets all the criteria for CCR set out in EN-1 and is, therefore, CCR.
- 2.3.5 The IPC should impose requirements on any consent, requiring operators to:
- retain control over sufficient additional space (whether on or near the site) for the carbon capture equipment;
  - retain their ability to build carbon capture equipment on this space (whether on or near the site) in the future; and
  - submit update reports on the technical aspects of its CCR status to the Secretary of State for Energy and Climate Change. These reports should be required within three months of the date on which a consented station first begins to supply electricity to the grid and every two years thereafter until the plant moves to retrofit CCS.

## Carbon Capture and Storage for coal-fired generating stations

- 2.3.6 As set out in EN-1, new coal-fired generating stations in England or Wales are required to be constructed with a full CCS chain fitted on at least 300 MW net of their proposed generating capacity. Coal-fired generating stations of less than 300 MW capacity are required to show that the proposed generating station will be able to capture, transport and store CO<sub>2</sub> from their whole capacity. Operators of fossil fuel generating stations will also be required to comply with any Emission Performance Standards (EPS) that might be applicable, but this is not part of the consents process.
- 2.3.7 The applicant should therefore provide evidence to show:
- technically feasible plans for a CO<sub>2</sub> capture unit that meets the minimum size requirements;
  - an Environmental Impact Assessment (EIA) that addresses impacts arising from the capture plant; and
  - documentation to ensure compliance with all other existing policy including that any of the plant's capacity which is not to be fitted with CCS at the outset is carbon capture ready.
- 2.3.8 An application must contain sufficient information on the proposed plans for CCS to enable the IPC to determine whether the proposal meets the required criteria as set out in the draft DECC guidelines<sup>5</sup> on CCS for developers. The IPC should also have regard to advice from the Environment Agency (EA) as

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<sup>5</sup> Draft Supplementary Guidance for Section 36 Electricity Act Consent Applications for Coal Power Stations.

to the technical feasibility of the proposed CCS. The IPC may also seek further independent advice, but is not required to do so.

- 2.3.9 If the IPC cannot be satisfied that the proposal meets the criteria relating to CCS set out in EN-1 and this NPS, consent should be refused.
- 2.3.10 The IPC should include in any development consent for a coal-fired generating station conditions that before construction can commence the applicant should provide:
- evidence that all necessary consents, licences and permits are in place for construction of the CCS chain, including consents for any onshore and offshore pipelines used to transport CO<sub>2</sub>;
  - evidence that a CO<sub>2</sub> storage licence for the intended storage site is in place; and
  - evidence that an Environmental Permit (EP) from the EA which incorporates conditions around the operation of the CCS chain is in place.
- 2.3.11 To avoid the possibility that, once built, a project became unsuitable for CCS, no construction, other than preliminary works, should be allowed to start until the IPC is satisfied that the above conditions have been fully met.
- 2.3.12 Additionally, CCR requirements will continue to apply to the remaining capacity of the coal-fired generating station until such time as CCS equipment is retrofitted onto the remainder of the capacity of the plant.

### Climate change adaptation

- 2.3.13 Part 2 of EN-1 covers the Government's energy and climate change strategy, including policies for mitigating climate change. Section 4.8 of EN-1 sets out generic considerations that applicants and the IPC should take into account to help ensure that fossil fuel generating infrastructure is resilient to climate change. As fossil fuel generating stations are likely to be proposed for coastal or estuarine sites and climate change is likely, for example, to increase risks from flooding or rising sea levels, applicants should in particular set out how the proposal would be resilient to:
- coastal changes and increased risk from storm surge;
  - effects of higher temperatures, including higher temperatures of cooling water; and
  - increased risk of drought leading to a lack of available cooling water.
- 2.3.14 Section 4.8 of EN-1 advises that the resilience of the project to climate change should be assessed in the ES accompanying an application. For example, climate change impacts on cooling water as a result of higher temperatures should be covered in the impact assessment section on water quality and resources.

### **Consideration of “good design” for energy infrastructure**

- 2.3.15 Section 10(3)(b) of the Planning Act 2008 requires the Secretary of State to have regard, in designating an NPS, to the desirability of good design. Section 4.5 of EN-1 sets out the principles for good design that should be applied to all energy infrastructure.
- 2.3.16 Applicants should demonstrate good design particularly in respect of landscape and visual amenity as set out in Section 2.6.3 below, and in the design of the project to mitigate impacts such as noise and vibration, transport impacts and air emissions.

## 2.4 Impacts of fossil fuel generating stations

### Introduction

- 2.4.1 Part 5 of EN-1 contains policy for the IPC when assessing potential impacts of energy infrastructure projects (identified as “generic impacts”). It also contains information to assist the interpretation of the impact sections of all of the energy NPSs (see Section 5.1). When considering impacts for fossil fuel generating stations, all of the generic impacts covered in EN-1 are likely to be relevant. This NPS has additional policy on:
- Air emissions;
  - Landscape and visual;
  - Noise and vibration;
  - Release of dust by coal-fired generating stations;
  - Residue management for coal-fired generating stations; and
  - Water quality and resources.
- 2.4.2 The impacts identified in Part 5 of EN-1 and this NPS are not intended to be exhaustive. Applicants are required to assess all likely significant effects of their proposals (see Section 4.2 of EN-1) and the IPC should therefore consider any impacts which it determines are relevant and important to its decision.

## 2.5 Air quality and emissions

### Introduction

- 2.5.1 Generic air emissions impacts other than CO<sub>2</sub> are covered in detail in EN-1. In addition there are specific considerations which apply to fossil fuel generating stations as set out below.
- 2.5.2 CO<sub>2</sub> emissions are a significant adverse impact of fossil fuel generating stations. Although an ES on air emissions will include an assessment of CO<sub>2</sub> emissions, the policies set out in Section 2.2 of EN-1 will apply, including the EU ETS. The IPC does not, therefore need to assess individual applications in terms of carbon emissions against carbon budgets and this section does not address CO<sub>2</sub> emissions or any Emissions Performance Standard that may apply to plant.
- 2.5.3 Fossil fuel generating stations are likely to emit nitrogen oxides (NO<sub>x</sub>) and sulphur oxides (SO<sub>x</sub>), although SO<sub>x</sub> emissions from gas-fired generating stations may be negligible. To meet the requirements of the Large Combustion Plant Directive (LCPD) and the industrial Emissions Directive (IED) when it comes into force, fossil fuel generating stations must apply a range of mitigation to minimise NO<sub>x</sub> and other emissions.
- 2.5.4 These emissions are regulated by the EA through the Environmental Permitting Regulations, which require developers to obtain an Environmental Permit (EP) before commencing operation of a new fossil fuel generating station. Details of the EP regime are set out in EN-1, Section 4.10.

### Applicant's assessment

- 2.5.5 The applicant should carry out an assessment as required in EN-1, consulting the EA and other statutory authorities at the initial stages of developing their proposals, as set out in EN-1 Section 4.2. If the applicant requests a scoping opinion from the IPC before an application is submitted, any views received from the EA should be made known to the IPC so that they can take account of the EA's advice on potential emissions.

### IPC decision making

- 2.5.6 In considering whether to grant consent, the IPC should take account of likely environmental impacts resulting from air emissions and that in the case of SO<sub>x</sub>, NO<sub>x</sub> or particulates in particular, it follows the advice in EN-1 on interaction with the EA's regulatory processes.

### Mitigation

- 2.5.7 Mitigation will depend on the type and design of a generating station. However Flue Gas Desulphurisation (FGD) and Selective Catalytic Reduction (SCR) – which reduces NO<sub>x</sub> by the injection of a suitable reagent into flue gas over a catalyst – will have additional adverse impacts for noise and vibration, release of dust and handling of potentially hazardous materials, for example the ammonia used as a reagent.

- 2.5.8 In line with Section 5.2 of EN-1 the IPC, in consultation with EA, should be satisfied that any adverse impacts of mitigation measures for emissions proposed by the applicant have been described in the ES and taken into account in the assessments.

## 2.6 Landscape and visual

### Introduction

- 2.6.1 Generic landscape and visual impacts are covered in detail in EN-1, Section 5.9. When considering landscape and visual impacts, the IPC should have particular regard to the impacts on National Parks, the Broads and Areas of Outstanding Natural Beauty as set out in EN-1. In addition to the impacts described in EN-1, there are specific considerations which apply to fossil fuel generating stations as set out below.
- 2.6.2 The main structures for a fossil fuel generating station, including the turbine and boiler halls, exhaust gas stacks, storage facilities, cooling towers, and water processing plant, are large. They will have an impact on the surrounding landscape and visual amenity. The overall size of the development will inevitably be dependent on technology and design. Coal-fired and biomass co-fired generating stations will require more space than other types of generating station for bulk material storage including coal and biomass fuels, limestone and other materials, milling plant and ash and gypsum storage prior to disposal. Night-time lighting for continuous operation will also have an impact on visual amenity.

### Applicant's assessment

- 2.6.3 The applicant should include a landscape and visual impact assessment as part of the ES, as set out in Section 4.2 of EN-1.
- 2.6.4 The applicant should also consider the design of the plant, including the materials to be used, and the visual impact of the stack, as set out in Section 5.9 of EN-1 in the context of the local landscape.

### IPC decision making

- 2.6.5 It is not possible to eliminate the visual impacts associated with a fossil fuel generating station. Mitigation is therefore to reduce the visual intrusion of the buildings in the landscape and minimise impact on visual amenity as far as reasonably practicable.
- 2.6.6 Applicants should design fossil fuel generating stations with the aim of providing the best fit with the existing local landscape so as to reduce visual impacts. This may include design of buildings to minimise negative aspects of their appearance through decisions in areas such as size, external finish and colour of the plant as far as compliance with engineering and environmental requirements permit. The precise architectural treatment will need to be site-specific.
- 2.6.7 Reduction of visual impacts may often involve enclosing buildings at low level as seen from surrounding external viewpoints. This makes the scale of the plant less apparent, and helps conceal the lower level, smaller scale features of the plant. Earth bunds and mounds, tree planting, or both may be used for softening the visual intrusion and may also help to attenuate noise from site activities. Where the existing landscape is more industrial, design may involve other forms of visual impact mitigation.

- 2.6.8 As stated in EN-1, the applicant should have undertaken an appropriate landscape and visual assessment using recognised methodologies and have taken measures to minimise the effects of the fossil fuel generating station on landscape and visual amenity as far as reasonably practicable. In considering whether the measures proposed are sufficient to achieve these objectives the IPC should take advice from the relevant statutory consultees.
- 2.6.9 In requiring any design adjustments to minimise adverse effects, the IPC needs to be aware of the statutory and technical requirements that inform plant design and may require the incorporation of certain design details for example chimney stack height, as set out in Section 5.9 of EN-1.
- 2.6.10 For the reason given in paragraph 2.6.5 above if, having regard to the considerations in respect of other impacts set out in EN-1 and this NPS, the IPC is satisfied that the location is appropriate for the project, and that it has been designed sensitively (given the various siting, operational and other relevant constraints) to minimise harm to landscape and visual amenity, the visibility of a fossil fuel generating station should be given limited weight.

## 2.7 Noise and vibration

### Introduction

2.7.1 Generic information on the assessment of noise and vibration impacts are covered in detail in Section 5.11 of EN-1. In addition there are specific considerations which apply to fossil fuel generating stations as set out below. Sources of noise and vibration from fossil fuel generating stations may include:

- milling of coal to create pulverised fuel and crushing of other materials for use in the generation cycle;
- delivery to, and movement of, fuel and materials at coal-fired generating stations;
- the gas and steam turbines that operate continuously during normal operation; and
- external noise sources such as externally-sited air-cooled condensers that operate continuously during normal operation.

### Applicant's assessment

2.7.2 The ES should include a noise assessment as described in Section 5.11 in EN-1.

### IPC decision making

2.7.3 The IPC should consider the noise impacts according to Section 5.11 in EN-1. It should be satisfied that noise will be adequately mitigated through requirements attached to the consent. The IPC will need to take into consideration the extent to which operational noise will be separately controlled by the EA.

2.7.4 The IPC should not grant development consent unless it is satisfied that the proposals will meet the aims set out in paragraph 5.11.9 in EN-1.

### Mitigation

2.7.5 As described in EN-1, the primary mitigation for noise from fossil fuel generating stations is through good design, including enclosure of plant and machinery in noise-reducing buildings wherever possible and to minimise the potential for operations to create noise. Noise from gas turbines should be mitigated by attenuation of exhausts to reduce any risk of low-frequency noise transmission.

2.7.6 Noise and vibration from features including crushing and milling machinery during operation of coal-fired generating stations is unavoidable. Similarly, noise from apparatus external to the main plant may be unavoidable. This can be mitigated through careful plant selection.

## 2.8 Release of dust by coal-fired generating stations

### Introduction

- 2.8.1 Generic impacts of the release of dust are described in Section 5.6 of EN-1. The normal operation of coal-fired generating stations will cause release of dust from such processes as fuel receipt and preparation, furnace maintenance and emissions reduction. Dust may also result from the transport and handling of fuel, materials and waste, for example:
- delivering fuel to the site;
  - using conveyors to move fuel from storage areas to crushing machines and furnaces;
  - delivery, removal and storage of materials such as limestone for flue gas desulphurisation and the resultant de-sulpho gypsum; and
  - removal and storage of combustion residues.
- 2.8.2 Dust particles that are less than or equal to 10 microns in diameter (PM<sub>10</sub>) are regulated as air emissions and are therefore included in the generic air quality impact policy in Section 5.2 of EN-1.

### Applicant's assessment

- 2.8.3 As specified in EN-1, Section 5.6, the applicant should set out in the ES the estimated potential for release of dust and measures proposed to mitigate any potential amenity impacts. The assessment should cover potential impacts arising specifically from the operation of a coal-fired generating station in addition to those identified in Section 5.6 of EN-1.

### IPC decision making

- 2.8.4 The IPC should ensure that the EA is satisfied either that there are no unacceptable dust effects, or, where there is a potential for unacceptable effects, releases of dust can be adequately regulated under the pollution control framework, or other regulatory controls, including requirements attached to a development consent, before it grants any consent.
- 2.8.5 It is possible that the application for the relevant operational permit from the EA may not be determined until after the IPC has decided the related major infrastructure application, since, for commercial reasons, many developers are not in a position to finalise details of the operational equipment until after a generating station development consent is received and the generating plant supplier selected. Whilst the IPC should not duplicate the regulatory controls that are separately exercised by the EA, neither should it consent a generating station where it has good reason to believe the relevant operational permits will not subsequently be granted. (See Section 4.10 of EN-1.)

## Mitigation

2.8.6 The range of mitigation measures may include:

- enclosed storage with extraction and arrestment plant as appropriate, for example vented and filtered silos for dry powder materials;
- enclosure of conveyors where possible and the height of drops where coal is discharged on to stockpiles or transferred between conveyors minimised;
- landscaping such as tree-planted bunds as wind-breaks to reduce the potential for wind-blown dust;
- dust suppression systems may be employed for example water sprays, atomised mist or polymer coating;
- control of vehicles and mobile plant movement around materials handling areas to reduce grinding of materials into fine dust; and
- specifying limits on site traffic movements or speed, or specifying maximum drop heights for conveyors.

## **2.9 Residue management for coal-fired generating stations**

### **Introduction**

- 2.9.1 Generic waste management impacts are set out in Section 5.14 of EN-1. This Section describes how the waste hierarchy described in EN-1 should be followed in relation to coal-fired generating stations.
- 2.9.2 The combustion of coal in the form of pulverised fuel gives rise to both coarse furnace bottom ash and fine pulverised fuel ash (pfa). Both types of ash must be removed and disposed of according to waste regulations.
- 2.9.3 The by-product of the limestone/gypsum FGD process is “de-sulpho gypsum”. This is used in the manufacture of building materials such as plasterboard. Generally furnace bottom ash is sold for concrete or road fill. Low carbon content pfa is used for pre-cast concrete. Higher carbon content pfa may be re-burned to recover some of the residual calorific value.

### **Applicant’s assessment**

- 2.9.4 The applicant should assess the production and disposal of ash and de-sulpho gypsum as part of the ES. (See Section 4.2 of EN-1.) Any proposals for recovery of ash and mitigation measures should be described. Ash disposal schemes may have benefits where they result in the reclamation of derelict land and the application should set out any opportunities that have been actively sought.

### **IPC decision making**

- 2.9.5 Primary mitigation measures to reduce the amount of ash produced are to use coal which will have a lower ash content or to co-fire biomass (which generally has a relatively low ash content) to replace some of the coal. Although the scope for both these measures may be limited, for example where suitable fuel is not readily obtainable, the IPC should expect the applicant to demonstrate it has explored the options in this area and proposed such mitigation where possible.
- 2.9.6 The IPC should be satisfied that waste management arrangements minimise the amount of residue that cannot be used for commercial purposes. Schemes that propose reclamation of derelict land through ash disposal should be the preferred mitigation for residues that cannot be used for commercial purposes. However alternative waste management arrangements may be acceptable.
- 2.9.7 The IPC should consult the EA on the suitability of the proposals for ash and de-sulpho gypsum disposal. If the EA has indicated that it has no reason to suppose that it would not be able to issue an EP for operation of the proposed coal-fired generating station and agrees that waste management arrangements suitably minimise the wider impacts from ash disposal, the IPC is likely to be able to give any remaining impacts of ash disposal limited weight.

- 2.9.8 The IPC may want to encourage regular review of waste management arrangements in order that new opportunities for improvement are considered. It may therefore decide to include a condition with any consent given that requires the applicant to periodically re-submit its waste management arrangements, revised as necessary, to the relevant Local Planning Authorities, which would be able to agree the revised arrangements if acceptable.

## 2.10 Water quality and resources

### Introduction

- 2.10.1 Generic water quality and resource impacts are set out in Section 5.15 of EN-1. The design of water cooling systems for fossil fuel generating stations will have additional impacts on water quality, abstraction and discharge. These include:
- discharging water at a higher temperature than the receiving water, affecting the biodiversity of aquatic flora and fauna;
  - use of resources may reduce the flow of water courses, affecting the rate at which sediment is deposited, conditions for aquatic flora and potentially affecting migratory fish species (for example salmon);
  - “fish impingement and/or entrainment” – i.e. being taken into the cooling system during abstraction; and
  - chemical anti-fouling treatment of water for use in cooling systems may have adverse impacts on aquatic biodiversity.

### Applicant's assessment

- 2.10.2 Where the project is likely to have effects on water quality or resources the applicant should undertake an assessment as required in EN-1 Section 5.15. The assessment should particularly demonstrate that appropriate measures will be put in place to avoid or minimise adverse impacts of abstraction and discharge of cooling water.

### IPC decision making

- 2.10.3 The IPC should be satisfied that the applicant has demonstrated measures to minimise adverse impacts on water quality and resources as described above and in EN-1.

### Mitigation

- 2.10.4 In addition to the mitigation measures set out in EN-1, design of the cooling system should include intake and outfall locations that avoid or minimise adverse impacts. There should also be specific measures to minimise fish impingement and/or entrainment and excessive heat from discharges to receiving waters.

# Glossary

AoS	Appraisal of Sustainability
Associated infrastructure	Development associated with the NSIP as defined in Section 115 of the Planning Act
Biomass	Material of recent biological origin derived from plant or animal matter.
CCGT	Combined Cycle Gas Turbine
CHP	Combined Heat and Power
CCS	Carbon Capture and Storage
CCR	Carbon Capture Readiness
CLG	Department for Communities and Local Government
Co-firing	Use of two fuel types (e.g. coal and biomass) in a thermal generating station (qv)
DECC	Department of Energy and Climate Change
Defra	Department of Environment, Food and Rural Affairs
DfT	Department for Transport
EA	The Environment Agency
EIA	Environmental Impact Assessment
EN-1	Overarching NPS for Energy
EP	Environmental Permit issued by the EA (qv).
ES	Environmental Statement
FGD	Flue Gas Dispersion, a technique for reducing emissions from fossil fuel generating stations.
Generic Impacts	Potential impacts of any energy infrastructure projects, the general policy for consideration of which is set out in Part 5 of EN-1
Habitats Directive	The European Directive (92/43/EEC) on the Conservation of Natural Habitats and Wild Flora and Fauna
Habitats And Species Regulations	The Conservation of Habitats and Species Regulations 2010 (SI2010/490), which implement the Habitats Directive and relevant parts of the Birds Directive.
HRA	Habitats Regulations Assessment
OCGT	Open Cycle Gas Turbine
NSIP	Nationally Significant Infrastructure Project
pfa	Pulverised fuel ash; fine ash from the use of finely crushed coal in fossil fuel generating stations.
SEA	Strategic Environmental Assessment (under the Directive 2001/42/EC)
Thermal Generating Station	Electricity generating station that uses a heat source (combustion of fuel or nuclear) to create steam that drives a generating turbine or which uses gas directly to drive a generating turbine.





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Energy Planning Reform  
Department of Energy & Climate Change  
Area 3A  
3 Whitehall Place  
London  
SW1A 2AW  
[www.decc.gov.uk](http://www.decc.gov.uk)



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